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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,070	10/22/2003	Masaru Murashita	29A 3485	9319

3713 7590 02/03/2005

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EXAMINER

JAWORSKI, FRANCIS J

ART UNIT	PAPER NUMBER
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3737

DATE MAILED: 02/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/691,070	MURASHITA, MASARU	
	Examiner	Art Unit	
	Jaworski Francis J.	3737	

-- Th MAILING DATE of this communication appears on th cover sheet with th correspondenc address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 January 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1 - 7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                                                         |                                                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                             | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10223, 12104, 1/04</u> . | 6) <input type="checkbox"/> Other: _____                                                |

## DETAILED ACTION

### *Drawings*

The drawings are objected to because:

a) in Box 34 of Fig. 2 typo correction should be made to -- EXTRACTING --.

b) 37 C.F.R. 1.84 (i) (Arrangement of Views) requires that the drawings either be read vertically from the drawing page top or with the top of the drawing page on the right, hence the Figure No. legend in Fig. 2 should be below the drawing, the drawing legends read left to right and the numerals be read the same as the legends, under whichever of the two options the applicant chooses to present the drawing for viewing. .

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of

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any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[ Parenthesized claim numbers pertain to the specific claim or claims being addressed by the immediately preceding rejection statement.]

Claims 1-2, 6-7 are rejected under 35 U.S.C. 102(b) as anticipated by Hatfield et al (US5779641) or, in the alternative, under 35 U.S.C. 103(a) as obvious over Hatfield et al in view of any one of Pesque et al (US5669385) or .Kamiyama et al (US6436049) or Kajiwara et al (US5931784).

Hatfield et al is directed to formation of a projection image with reduced speckle artifact which represents a selected view from 3D volumetric data chosen to encompass

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a region of interest, in the context of vascular studies where B-mode intensity i.e. anatomic image of stationary as well as moving structures is obtained alone or together with a color flow Doppler image alone or together with a power Doppler image in order to variously emphasize and differentiate moving vascular structure and blood flow as well, see col. 1 lines 14-47, col.3 lines 8-40, col. 10 lines 58-61 and col. 11 lines 47-52. Since in the context of B-mode intensity the blood vessel interior is less echogenic than its surroundment, in order to practice projection along a view rayline based upon a pixel maximum intensity, the pixel intensity data must be inverted in order to practice maximum intensity projection (MIP). Col. 2 line 13 otherwise read as -- blood vessels, heart cavities etc. .. -- makes clear that Hatfield et al are intent upon providing a three-dimensional image of the vessel or( ventricular) heart cavity as called for in the base claim.

In the alternative, whereas Hatfield et al confines inversion discussion to intensity mode pixel values, it would have been obvious in view of Pesque et al that in order to differentiate the capacity within the ventricle by MIP using the Doppler power signals as called for in Hatfield et al as per Pesque et al col. 2 lines 4 – 13 and col. 7 lines 14-17, one must distinguish the Doppler power of the moving ventricle from that of the moving blood within the ventricle by multivariate analysis as shown in Figs. 6-7, and by inverting these transfer functions bloodflow may be projected rather than tissue, see col. 8 lines 41 – 45.

In the alternative still, whereas Hatfield et al are silent as to the use of contrast agents, Kamiyama et al notes that when contrast agents are injected as is common in

vascular imaging, blood within the vessel now becomes more echogenic than tissue and therefore 'reverse inversion' must be practiced in order to now visualize tissue, see col.2 line 59 – col. 3 line 29 and Fig. 7A of Kamiyama et al where the terms 'luminance reversal' are akin to inverse contrast brightness imaging.

In the alternative still, or more properly, as an improvement to blending of B-mode and Doppler power images as called for in Hatfield et al, it would have been obvious in view of Kajiwara et al Fig. 8 element 42 to invert at least the B-mode pixel intensity data in order to better differentiate stationary from moving structures. (Claims 1 and 6 - 7).

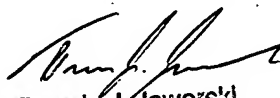
As noted above, Hatfield et al is directed to delimiting an ROI for the image, see col. 5 lines 35 – 44. (Claim 2).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied against claim 1, further in view of Iizuka et al (US5469850) or Miyazaki et al (US5215093).. Whereas the former are silent as to binarization since the MIP technique in and of itself yields a varying pixel intensity value across the projection plane, it would have been nonetheless obvious in view of Iizuka et al Figs. 46A,B and attendant text to further binarize the image data in order to simplify the obtainance of the vessel wall outline, or in the case of Miyazaki et al Fig. 19 elements 1901-1904 and attendant text to binarize within data of like type i.e. flow, for example by assigning one binary value to flow above average and another to the residual in order to further characterize higher flow regions. (Claim 3).

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Claims 4 – 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied against claim 1 above, and further in view of Prater et al (US5322067). Whereas the former are silent as to the use of the isolated cardiac cavity or vessel region for quantitations, it would have been obvious in view of the latter to use the results of a segmentation or regional chamber delineation to determine for example ejection fraction defined as left ventricular volume change during heart contraction or other values of interest to the cardiologist. for diagnosis (see col. 6 line 60 – col. 7 line 6 as well as col. 12 lines 33 – 68).

Any inquiry concerning this communication should be directed to Jaworski Francis J. at telephone number 575-272-4738.



Francis J. Jaworski  
Primary Examiner

.FJJ:fjj

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